

## **APPENDIX B**

### **RESPONSES TO THE CONCERNS OF “PINE ROCK TIMBER HARVEST AND RIPARIAN ENHANCEMENT PROJECT”**

A description of the proposal was included in the Salem Bureau of Land Management *Project Update* which is mailed to more than 900 individuals and organizations four times each year. Letters were also sent to the Confederated Tribes of Grande Ronde; Confederated Tribes of the Warm Springs Reservation of Oregon; six federal, State, county and local government organizations; two municipal water supply officers; five interested groups; three individuals and the Molalla River Watch.

The EA was mailed to approximately 21 agencies, individuals and organizations on May 26, 1999. A legal notice was placed in local newspapers soliciting public input on the action from June 1 to July 1, 1999. The comment period was extended to July 23, 1999 to facilitate access to the watershed analysis. Three comment letters were received from the Canby Utility Board, Molalla River Watch, Inc., and Brenna Bell, Oregon Natural Resources Council and Northwest Environmental Defense Center. An additional letter was received after the comment period from the American Lands Alliance and Santiam Watershed Guardians.

The comments have been divided into 6 categories: water quality, silviculture, soils, wildlife, botany and cumulative impacts.

The following comments are a response to concerns about the Proposed Pine Rock Timber Sale.

#### **1. Water Quality**

##### **Comment:**

The Oregon Department of Environmental Quality published a report that lists the Molalla River as having severe turbidity and erosion problems; and moderate temperature, sediment and dissolved oxygen problems.... Baseline data, especially temperature and turbidity during peak flows should have been gathered and included in the EA.

##### **Response:**

The water quality information presented in the EA was summarized from the best available BLM, private and state data. Inferences on the condition of the Bear and Horse Creek watersheds were made also by interpretation of aerial photographs and field surveys. Specialists in soil, hydrology, aquatic biology, riparian ecology and forestry analyzed available data to determine current stream and watershed conditions, and impacts from this proposal.

The Molalla River is 303(d) listed for summer stream temperatures, flow modification and water contact recreation. The proposed Pine Rock Timber Sale has little relationship to flow modification or fecal coliform at recreation sites (U.S. EPA, 1991 p.50).

Only stream temperature effects are potentially at issue in the Pine Rock proposal relative to the State of Oregon's Total Maximum Daily Load (TMDL) assessment in the Molalla watershed.

As indicated in your comments and the EA, the ODEQ has also published an assessment, the 319 Report, which identifies streams with potential non-point water pollution problems (ODEQ, 1988). However, your comments incorrectly cited this report, which is summarized below.

*Table 1. 1988 Oregon Statewide Assessment of Non-Point Sources of Water Pollution*

<b>Basin: Stream</b>	<b>Water Quality Condition Affecting:</b>				
	<b>General Water Quality</b>	<b>Drinking Water</b>	<b>Recreation/ Shellfish</b>	<b>Fish</b>	<b>Aquatic Habitat</b>
<i>Molalla: Reach # 54</i>	S2	NP	NP	M1	S2
<i>Molalla: Reach # 55</i>	M2	NP	NP	M2	M2
<i>Molalla: Horse Creek And Upstream</i>	NP	NP	NP	NP	NP

S1= Severe Problem with data.

S2 = Severe Problem based on observation (no collaborating data).

M1= Moderate Problem with data.

M2= Moderate problem based on observation (no collaborating data).

NP= No problem and/or no data available.

No water quality problems were identified in this report for the Molalla River above Reach 55, which ends approximately at Horse Creek. Significantly, no water quality problems affecting drinking water supplies for the city of Molalla or Canby were identified in this ODEQ report. Finally, in only two instances were the identified problems based on actual water quality measurements: low flow and dissolved oxygen measurements in Reach 54 (i.e., the lower Molalla River). The only problem identified near the project area was a "moderate sediment problem based on observation" in Reach 55 (downstream from Horse Creek). The report offered no further description of the problem and no supporting sediment data.

The ID Team did not consider the immediate collection of additional baseline water quality data to be necessary for an adequate evaluation of the affected environment or the environmental consequences of project alternatives. The *Environmental Consequences and the Cumulative Effects* section of the EA identified potential sources of sediment and thermal loading and evaluated the risks to water quality. Due to site factors (nearly flat surfaces which offer little opportunity for sediment delivery to streams) and the implementation of Best Management Practices (BMPs i.e., large, intact stream-site buffers, construction limited to dry periods, etc.), the risk of sediment delivery from road construction is low. In addition, as stated on page 39 of the EA, shading adjacent to stream channels is currently adequate for the maintenance of cool water and will be left virtually unaltered under this proposal. In light of this, the IDT concluded that the risk of water quality degradation as a consequence of the proposed action is low.

The Project will meet the Aquatic Conservation Strategy objectives (RMP p.5) using Best Management Practices (RMP, Appendix C), which will further reduce the project's effect on water resources. (EA, Appendix D)

#### **a. Temperature**

##### **Comment:**

All of the alternatives include thinning in Riparian Reserves that will lead to a decrease in canopy closure, corresponding with a temperature increase.

##### **Response:**

Although the ID Team recognized that summer water temperatures above the state threshold of 17.8 °C have been measured in the Molalla mainstem below the project area (Molalla WSA), the proposed action should not risk further increases in summer stream temperature for the following reasons.

The proposed thinning is now reduced to three acres. The thinning would reduce crown closure from approximately 90 to 50 percent on those three acres of riparian vegetation along a first order channel that drains to the mainstem of the Molalla in the Horse Creek sub-watershed (not the Bear Creek watershed identified in the comments). The thinning would affect less than 5 percent of the approximately 60 acres of riparian forest along this channel in the project area and would not affect any vegetation that directly shades the channel. A 60-80 foot no-treatment buffer area would protect the small, stable, perennial low gradient channel adjacent to the proposed thinning.

Reductions in canopy closure, particularly when the affected vegetation is a substantial distance from the channel, do not automatically lead to a corresponding increase in stream temperature. Rather, the environment assessment concluded that the proposal would be unlikely to affect stream temperatures in the project area. This conclusion was based on observations of current stream temperatures and stands conditions in the project area, extrapolation from a stream temperature study conducted on McFall Creek, and observation of temperatures in small headwater streams without buffers on clear cut units on private lands.

Stream temperature regimes in forest headwater channels are closely linked to ground water temperature. In many cases, topographic shading together with brush and woody debris cover precludes extensive portions of these channels from direct exposure to sunlight. Even with removal of the entire upper canopy, headwater channels will not necessarily gain heat if substantial small scale cover remains intact. In the case of stand thinning, both small-scale cover and significant portions of upper story cover remain intact.

#### **b. Roads Construction on Water Quality**

##### **Comments:**

The probable causes of water quality problems in the Molalla River are landslides, road runoff and road location. The proposed Pine Rock sale will increase the turbidity of the upper Molalla. (Effects of road construction on water quality and turbidity)

**Response:**

The potential for road related increases in sediment delivery to streams were considered in the design of this proposal. The analysis stated that the road construction would result in “minimal sediment inputs to streams” (EA, p. 38). That conclusion was based upon the fact that all road construction would occur out of riparian reserves on low to moderate stable slopes off of the existing road network. The risks of road related landslides in these locations are minimal since no additional stream crossing would be constructed. Under this proposal, road construction would not cause an expansion of the stream network nor would it provide additional opportunities for road sediment from fill failures or ditch-line run-off to enter stream channels.

The EA identifies potential sources of sediment and thermal loading and evaluates the risk to water quality. Due to site factors and the implementation of the BMPs, the risk of sediment delivery from road construction is low. All road construction would utilize the BMPs required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce non-point source pollution to the maximum extend practicable. BMPs recognize and make use of the fact that, although road construction does lead to an inevitable increase in sediment available for erosion, without pathways or mechanisms for that sediment to enter streams, it will not affect water quality.

The proposal also includes decommissioning of all new construction. Some of the roads identified for decommissioning in the EA, south of Pine Rock, were already decommissioned under a previous Jobs-in- the-Woods Molalla Road Restoration Project. (EA p. 38).

**2. Silviculture****a. Riparian Reserve Treatments****Comments:**

The Riparian Reserves do not “need” the proposed thinning since the project is only meant to hasten what would naturally occur in the stand if were left to develop on its own. It is not clear in the EA how thinning is needed to diversify the stand structure of naturally regenerated areas.

**Response:**

The three acre area (reduced from 54 acres in the EA) proposed for density management in the selected alternative is part of 90 year old mature seral stage stand that was commercially thinned in the mid–1970’s. Stand structure here has been simplified to an evenly spaced stand with one main, high canopy level. A variable retention thinning is prescribed to encourage overstory spacing density, and to promote continued understory conifer development. A cohort of conifer regeneration was initiated from the past thinning on this site, but is now stagnating from the suppressive effects of the overstory. Crown closure that currently averages approximately 90 percent would be lowered to an average of 50 percent on this site.

This type of treatment is necessary to afford the light levels needed for understory conifer development. Approximately 40 to 50 trees per acre would be cut and removed from this site, leaving approximately 50 residual trees per acre. Trees would be removed so as not to create conditions that would favor the Douglas-fir bark beetle. An insect infestation would be a serious concern if that many large Douglas-fir trees were left on the ground. Those insects would then pose a serious threat to the health of the residual green trees on the site. Coarse woody debris (cwd) requirements would be met.

This prescription supports the management recommendation from the Molalla Watershed Analysis (MOWA) (p. 175-177), which advises us to treat Riparian Reserves exhibiting these characteristics to restore some of the stand level attributes that have been removed. By selectively thinning and creating some small canopy gaps in the existing canopy we can help to maintain and enhance the understory vegetation initiated by the last thinning. This would also help to provide us with diverse species composition, diverse age classes, a multi-layered canopy, and a wider range of diameter classes. The treatment would be designed to ensure that adequate amounts of coarse woody debris and snags would be created, as they are currently lacking in the area.

### **3. Soil**

#### **a. Soil Productivity and Harvest**

##### **Comments:**

An issue of concern in the silviculturalist's report was to insure that soil productivity of the area would be maintained. ...Cable yarding will decrease soil productivity by 1-3 percent. EA, p.36. The helicopter and ground based yarding will also decreas[e] soil productivity from 1-2 percent, EA, p.37. This does not comply with the [silviculturalist] management prescription in the analysis file.

##### **Response:**

The 1-3% productivity loss as described in the EA refers to soil disturbance within the cable yarding corridors and does not conflict with the Silvicultural Prescription. The prescription refers to long-term productivity in the following two places:

- Management Direction: "Provide a sustainable supply of timber and other forest products." (p.1, Silv Prescrip.)
- Desired Future Conditions: "For subsequent rotations the productivity of this site will be maintained." (p. 15, Silv. Prescrip.)

Experience has shown that the canopy of the residual trees will close over the yarding corridors within 10 years, resulting in accumulation of litter, coarse woody debris and increased plant growth, recovering any losses in site productivity from the project. In addition, commercial thinning treatments for this project are expected to increase future yields and productivity on these stands because of the wider spacing on the residual trees, which can also offset productivity losses from cable yarding. Therefore, the project will meet the objectives described in the Silvicultural prescription.

The 1 to 3 percent long term productivity loss associated with decrease in soil productivity is within the 5 percent maximum productivity loss stated in the ROD, RMP (Salem District Record of Decision and Resource Management Plan. May, 1995).

## **2. Burning and Soil Productivity**

**Comment:** The EA also did not address the impact of broadcast burning on soil productivity.

### **Response:**

The impact of broadcast burning on soil productivity is described on page 44 of the EA. No broadcast burning will take place on this sale since the selected action is commercial thinning (DR p.7). The BLM plans on under-burning approximately 175 acres on the Pine Rock Timber Sale. The acres selected for burning are generally south slopes with good fire control lines.

The main objectives for burning are: removing the fire hazard on a portion of the sale, providing ecological diversity with a mosaic burn, maintaining fire adaptive traits of current plant species and providing some fire killed snags for snag-dependent animals.

Burning can affect soil productivity in many ways, the most important affected soil properties are loss of organic matter, the nitrogen released as gas, also phosphorous and sulfur, loss of soil microbes and loss of CWD.

On Pine Rock Timber Sale, the burn prescription will be written to preserve 50% of the above ground organic matter, all of the above ground coarse wood and maintaining 95% of the canopy. Our experience over the last ten years shows that we will burn approximately 75% of the surface area, leave 75% of the organic matter untouched in the burned area, and leave all of the over three (3) inch coarse wood. In addition less than 5% of the green trees will be killed.

An important fact to consider is that the sale area will have plenty of standing green trees to input the components of organic matter. These inputs are in the form of needles and small branches. Even though part of the aerial portion of organic matter will be lost it will be replaced within a year and loss of soil productivity for the stand from that point will be very short term.

The availability of nitrogen, phosphorous and sulfur inputs to the soil is dependent on the inputs of plant material to the soil surface on a continual basis. Fire removes this material (and inputs more available minerals with ashes, in a very short time) in varying amounts depending on fire severity. Since the fire intensity will leave approximately 50% of the organic matter intact, it will release as a gas the small fraction of the available nitrogen, phosphorous and sulfur in the burned area.

With a low fire intensity the below ground organisms will be little affected, if at all. The large coarse wood (larger than 8 inches), which is scarce on the site, will be charred, but not consumed by the low intensity fire.

### **3. Road Construction and Soil Productivity**

**Comments:**

What is the amount of soil productivity lost by building 7000 feet of new roads?

**Response:**

The estimated soil productivity loss due to road construction will be approximately 1 to 3 percent on 4 acres. Overall productivity loss from yarding and road construction will be within the 5% standard described in the previous section. However, road decommissioning will break up soil compaction enough to reestablish water infiltration and vegetation (including trees from natural seeding – alder, Douglas-fir) in the road.

### **4. Wildlife**

#### **a. Survey and Manage Surveys**

**Comments:**

Adequate management plans are needed for the survey and manage mollusks found in the planning area.

**Response:**

The component two surveys for this project are in compliance with the Stipulation for Order Dismissing the Action (August 2, 1999) in the ONRC Action lawsuit. Survey and Manage mollusk species were surveyed for during the spring and fall of 1998 according to prescribed protocol. Of the eight species identified for surveying within the Cascade Resource Area two were detected. Those species were subsequently dropped from the survey and manage requirement by the FSEIS “for amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines” (November, 2000). No other survey and manage mollusk species were detected, therefore, no mitigation is required.

**Comments:**

The Pine Rock Timber Sale activities can affect Red Tree Voles, which could potentially be present. The BLM failed to conduct a survey for Red Tree Voles.

**Response:**

Red Tree Vole surveys were completed in 1999 and 2000 on the proposed project based on established protocol. Approximately 17 potential nests were identified. Subsequent climbing of all 17 trees revealed that none were red tree vole nests (active or inactive). Of the 17, 9 were determined to be bird nests, one a squirrel nest and the rest were collections of debris. No mitigation is required.

**b. Special Status Species****Comments:**

Mitigation measures needs to be described for the impacts of the proposed action on the special status herpetofauna.

**Response:**

Surveys were completed in accordance with survey protocols established in BLM Information Bulletin IB-OR-98-246, no survey and manage herpetofauna were located in the project area.

Of the five-**herpetofauna** species detected within the project area two (Oregon slender salamander and the red legged frog) are considered Bureau Tracking (BT) species based on Information Bulletin No. OR-2000-092, Oregon and Washington Bureau of Land Management Special Status Species List - January 2000.

The IB states for Tracking Species "... districts are encouraged to collect occurrence data on species for which more information is needed to determine status within the state or which no longer need active management". Further "...BT will not be considered as special status species for management proposes". No management recommendations are made for these species for the Pine Rock Timber Sale

**Comments:**

The EA did not analyze the effects of underburning on the herpetofauna.

**Response:**

Herpetofauna are most active during periods of high humidity, predominately in the spring and fall. Underburning will take place during the drier end of these conditions when herpetofauna are less active. Although the individual may be on the surface during underburning, the fire will burn in a mosaic pattern reducing the probability of affecting individuals that may be present. Primary habitat for these species is the coarse woody debris, which will be protected through contractually reserving all existing down logs within the units. Underburning will not consume these larger logs (see section 3.a.3. above). Future habitat, in the form of snags, would also be reserved and protected within the units where they do not compromise safety.



## 5. Botany

### a. General surveys

#### Comments:

The EA failed to identify and present management plans for many survey and manage species. The analysis file identified both Antrichia curtispindula and Ulotia megalospora as species that required riparian buffers.

#### Response:

General surveys for Survey and Manage (S&M) bryophytes and lichen were conducted in the sale areas during the summer of 1998. Surveys were conducted according to protocols defined in *Survey Protocols for Component 2 Lichens, March 1998*, December 1997 and *Guide for the Identification of Rare, Threatened or sensitive Bryophytes 1996*.

General surveys for S&M fungi were conducted in the sale areas during the spring and fall of 2000. Surveys were conducted according to protocol defined in the *Handbook to Strategy 1 Fungal species in the Northwest Forest Plan PNW-GTR-476*, October 1999. This information and the results of each survey are now a part of the record for this sale.

The EA states on page 20: “Ulotia megalospora, a Protection Buffer and common bryophyte species, was found to be ubiquitous (widespread) in the riparian areas of the Pine Rock timber sale. Ample habitat for Ulotia megalospora would be protected within the TPCC reserved, and other resource withdrawn areas and in the riparian reserves in all alternatives”.

Ulotia megalospora has been removed from Survey and Manage Protection (FEIS January 2001). This species was found to be “not closely associated with late-successional or old-growth forest. Common.” (pg. 101 Appendix F of *FEIS for Amendment to the Survey and Manage, Protection Buffer and other Mitigation Measures Standards and Guidelines*. January 2001)

Survey and Manage Fungi Sites located within the Pine Rock Timber Sale were: Helvella maculata, Otidea leporina, Otidea onotica, Otidea smithii, Ramaria araiospora, Sarcosoma mexicanum, Sowerbyella rhenana.

Sarcosoma mexicanum has been removed from Management Requirements in the Oregon Coast Range and Oregon Willamette Valley provinces. Reasons for reassignment of species are: (*Final Supplemental Environmental Impact Statement (FEIS). Appendix F page 85*). (1) High number of total sites in this portion of the Northwest Forest Plan area. (2) Found routinely in young stands. (3) Well distributed. (4) Moderate proportion of sites and likelihood of habitat in protected land allocations.

*Otidea onotica* has been placed in Category F and has been recommended for removal from Survey and Manage Categories. Reasons for reassignment of species are: (FEIS Appendix F page 80). (1) Moderate to high number of sites in the Northwest Forest Plan area. (2) Late-successional or old-growth forest association questionable. (3) May be common. (4) Predisturbance surveys are not practical; multi-year surveys are required.

#### **b. Mitigation and/or adjustment**

No mitigation or adjustments are required for the above two species.

*Helvella maculata* has been placed in Survey and Manage Category B, due to the “low number of total sites in the Northwest Forest Plan area”. (FEIS Appendix F page 77).

*Otidea leporina* has been placed in Survey and Manage Category B, due to the “low number of total sites in the Northwest Forest Plan area”. (FEIS Appendix F page 80).

*Otidea smithii* has been placed in Survey and Manage Category B, due to the “Very low number of total sites in the Northwest Forest Plan area”. (FEIS Appendix F page 80).

*Ramaria araiospora* has been placed in Survey and Manage Category B due to the “low number of total sites in the Northwest Forest Plan area”. (FEIS Appendix F page 82).

*Sowerbyella rhenana* has been placed in Survey and Manage Category B due to the low number of total sites in the Northwest Forest Plan area; rare. (FEIS Appendix F page 86).

Two sites of *Helvella maculata* and one site of *Otidea leporina* were found within existing Riparian Reserves and will be well protected by those buffers. These sites are not within the proposed 3-acre Riparian Reserve thinning treatment area.

The remainder of the sites has been buffered (a no entry buffer) with consideration for a number of ecological variables including, aspect, slope, canopy closure, herbaceous ground cover, moss cover, and incident solar radiation. These conditions will vary from site to site and will be implemented with the intention of maintaining existing site and microsite conditions in accordance with the Management Recommendations for Survey and Manage Fungi (Castellano & O'Dell 1997).

## **6. Environmental Consequences and the Cumulative Effects**

### **Comments:**

BLM has to consider that Horse and Bear Creeks are in the high category for ECA and are expected to stay there for the next two decades.

**Response:**

Cumulative effects were evaluated in the Horse Creek sub-watershed in the Molalla River Watershed. The Horse Creek sub-watershed comprises 3,382 acres of which 3,043 acres are in BLM ownership while the remainder is managed by state and private landholders.

As your comments indicate, relatively high Equivalent Clear-cut Acres (ECA) values for Bear Creek and Horse Creek were noted in the Molalla Watershed Analysis. Watershed Analysis recommendations were followed explicitly in the analysis for this proposal. The Management Recommendations section of the MOWA (p. 183) states, “Consider ECA values when designing ground-disturbing activities in these sub-watersheds. “Look for opportunities to reduce the openings in the forest canopy using road decommissioning or heavy thinning in forest stands rather than regeneration harvests”.

Alternatives A and B both evaluate the option of thinning all 425 acres in the project area relative to a regeneration treatment of 143 acres and thinning of 282 acres in alternatives C and D. The Cumulative Effects Analysis (CEA) indicated that, for the actions on public lands, alternative A or B would result in no net increase in ECA values for both Horse and Bear Creeks while alternatives C and D would increase ECA to 23.8% and 10.3% in Horse and Bear Creeks, an increase beyond current levels of 2.4% and 0.2% in ECA, respectively. All of the predicted increases in total ECA values under alternative A and B are due to an assumption of harvest activities on private lands that would occur, or not, regardless of actions taken in this proposal. In fact, alternative A or B predict a slight decrease in ECA on public lands in the Bear Creek watershed as result of 0.4 miles of road decommissioning.

Similarly, predicted Water Available for Run-off (WAR) values are slightly higher under alternatives C and D than in alternative A and B. Increase in the 2+ return period in the Horse Creek watershed range from 2.6% to 3.3% for alternative A/B and C/D, respectively. In both cases they remain below 20% relative to an assumed full forest cover. WAR values in the Bear Creek watershed for the 2+ return intervals are currently 24.7% above an assumed full forest cover. The analysis predicted increase to 24.9% (increase of 0.2%) over full-forest cover for all the alternatives.

## **7. Conclusions**

? The ID Team did not consider the immediate collection of additional baseline water quality data to be necessary for an adequate evaluation of the affected environment or the environmental consequences of the proposal action. This proposal will leave a substantial untreated buffer, and there is unlikely to be any measurable effect to stream temperatures as a result of the proposed thinning. As stated on page 39 of the EA under this proposal the shading adjacent to stream channels will be virtually unaltered to maintain cool water. The IDT concluded the risk of water quality degradation as a consequence of the proposal is low.

? Under this proposal, road construction would not cause an expansion of the stream network nor would it provide additional opportunities for road sediment from fill failures or ditch-line run-off to enter stream channels. Road construction during dry periods would limit sediment input into streams to near negligible levels (EA p. 38). Road decommissioning would be in compliance with the Molalla River Watershed Analysis and with the Aquatic Conservation Strategy and would further reduce sediment inputs to stream

? Approximately 3 acres of Riparian Reserves would be treated to help the Aquatic Conservation Strategy Objectives. This area has a variable retention thinning to encourage overstory spacing density, and to promote continued understory conifer development. No fragmentation that would degrade the existing environment within the Riparian Reserves would occur.

? The proposed treatments would help to hasten the development of the structural attributes commonly found in late-seral forest. By hastening the development of, and maintaining this habitat type in the project area, we would be benefiting the populations of species dependant on these attributes.

? All units in Sec. 9,10 (EA A-2) are mapped as having no soils limitations that would withdraw them from the timber sale. Soil productivity would decrease by 1-3%, on cable harvest units. Total productivity reductions from yarding and roads is within the 5% maximum productivity loss specified in the ROD, RMP (Salem District Record of Decision and Resource Management Plan. May, 1995).

? The BLM plans on under-burning approximately 82 acres on the Pine Rock Timber Sale. The acres selected for burning are generally south slopes with good fire control lines.

Since the fire intensity will leave approximately 50% of the organic matter intact it will also release as a gas the small fraction of the available nitrogen, phosphorous and sulfur in the burned area. With a low fire intensity the below ground organisms will be little affected, if at all. The large coarse wood (larger than 8 inches), which is scarce on the site, will be charred, but not consumed by the low intensity fire.

? No mitigation is required for mollusk species or red tree vole nests.

? Bureau Tracking species will not be considered as special status species of herpetofauna for management proposes. No management recommendations are made for these species for the Pine Rock Timber Sale. Herpetofauna are most active during periods of high humidity, predominately in the spring and fall. Underburning will take place during the drier end of these conditions when herpetofauna are less active.

Although the individual may be on the surface during underburning, the fire will burn in a mosaic pattern reducing the probability of affecting individuals that may be present. Primary habitat for these species is the coarse woody debris, which will be protected through contractually reserving all existing down logs within the units.

Underburning will not consume these larger logs (see section 3.a.3. above). Future habitat, in the form of snags, would also be reserved and protected within the units where they do not compromise safety.

? Two sites for *Helvella maculata* and one site of *Otidia leporina* were found within existing riparian reserves and will be well protected by designated buffers.

? The Timber Harvest Project follows the MOWA by designing ground-disturbing activities that reduce the openings in the forest canopy using road decommissioning or heavy thinning in forest stands rather than a regeneration harvest.

The Cumulative Effects Analysis (CEA) indicated that, for the actions on public lands, alternative A or B would result in no net increase in ECA values for both Horse and Bear Creeks. All of the predicted increases in total ECA values under alternative A and B are due to an assumption of harvest activities on private lands that would occur, or not, regardless of actions taken in this proposal. Alternatives A and B predict a slight decrease in ECA on public lands in the Bear Creek watershed as result of 0.4 miles of road decommissioning.

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